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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/568,350

10/23/2006

Marc Lievin

BRAUN-1

2658

23599 7590 12/12/2008
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EXAMINER

BITAR, NANCY

ART UNIT

PAPER NUMBER

2624

MAIL DATE

DELIVERY MODE

12/12/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/568,350	Applicant(s) LIEVIN ET AL.	
	Examiner NANCY BITAR	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 October 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 February 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11/2/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as follows:

Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.

When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and *Warmerdam*, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with *Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).

In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See *Lowry*, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

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1. Claim(s) 16 -17 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claim 16-17 defines “a program “embodying functional descriptive material. However, the claim does not define a computer-readable medium or memory and is thus non-statutory for that reason (i.e., “When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized” – Guidelines Annex IV). That is, the scope of the presently claimed “a program” can range from paper on which the program is written, to a program simply contemplated and memorized by a person. The examiner suggests amending the claim to embody the program on “computer-readable medium” or equivalent in order to make the claim statutory. Any amendment to the claim should be commensurate with its corresponding disclosure.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 18 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claim 18 provides for the use of “the method”, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

5. Claim 18 is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 16-17 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a plurality of structural elements performing the claimed functions, does not reasonably provide enablement for a single structural element performing all of the claimed functions. Claim 16 recites a "a system for carrying out the method in accordance with claim 1 ". There are no claimed structural elements in the body of the claim that are capable of performing the claimed method steps. Moreover, the specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims ("A single means claim, i.e., where a means recitation does not appear in combination with another recited element of means, is subject to an undue breadth rejection under 35 U.S.C. 112, first paragraph" because a single means claim covers "every conceivable means for achieving the stated purpose" and "the

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specification disclosed at most only those means known to the inventor” - *MPEP, at paragraph 2164.08(a)*). This is a “single-means” type rejection which could be overcome by adding sufficient structure, commensurate with the corresponding disclosure, to the body of the claim

7. Claim 3 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. the use of "and/or" is unclear whether the subject matter claimed is needed i.e. the difference in the image information content is the depth AND the perspective AND the type of display AND the depth information or the difference in the image information content is the depth OR the perspective OR the type of display OR the depth information.

Examiner Notes

8. Examiner cites particular columns and line numbers in the references as applied to the claims below for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested that, in preparing responses, the applicant fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1-13,16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Delegacz et al (Three-dimensional visualization system as an aid for lung cancer detection) in view of Cheng-Sheng et al (Fast volume rendering for medical image Data).

As to claim 1, Delegacz et al teaches a method for presenting image data (1) that represents a three-dimensional object (7) in a space (see abstract) , wherein projection data which represents a two-dimensional projection (6) of the object (7)(hybrid technique, paragraph 2, page 402) are generated by computational superimposing of multiple image planes (employ the 2-D paradigm, slice sequence of 2D images, page 402, paragraph 2) , and wherein the projection (6) is displayed on a monitor for viewing by a user (note that 2D images can significantly enhance the ability to understand the overall 3-D, picture , page 402, paragraph 2, figure 4) , characterised in that a sub-area (8) is selected from the projection (6) (selecting the regions of interest for further viewing , see abstract), wherein a detail image (9) having different information content than the projection (6) is generated inside the sub-area (8), and wherein the detail image (9) is displayed within the sub-area (8) on the monitor (paragraph 2, figure 4) . While Delegacz meets a number of the limitations of the claimed invention, as pointed out more fully above, Delegacz fails to specifically teach the “ detailed image is shown on the screen

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within the subregion” Specifically, Cheng Sheng et al. teach the display of the image (x, y) in the center row (see page 55, section 2.2-2.3, left image). it would have been obvious to one of ordinary skill in the art to locate the image within the subregion in Delegacz display in order to see more clearly the inside structure of the human body, thus achieving the goal of simulated surgery. Therefore, the claimed invention would have been obvious to one of ordinary skill in the art at the time of the invention by applicant.

As to claim2, Delegacz et al teaches method in accordance with claim 1, characterised in that the detail image is generated in direct or indirect recourse to the image data (1) from which the projection is generated, wherein this image data (1) is collected in a first data record (shear-warp factorization algorithm; saving the single rendered frame to a disk file, section 5.2, page 406).

As to claim 3, Delegacz et al teaches the method in accordance with claim 1, characterised in that the user selects one of several possible detail images (9), which differ in their information content, particularly in the depth and/or the perspective and/or the type of display and/or the depth of information represented by the detail image (9) (the user interface allows, among others, to change the size of displayed slices, fwd or rewind the slices, the user can choose the full set of slices including the intermediate ones or the collection of original slices only, section 5.1, page 405) .

As to claims 4 and 8, Cheng-Sheng et al teaches method in accordance with claim 1, characterised in that a detail image (9) is a sub-projection (10) which differs from the projections (6) in that the depth of field is greater and fewer image planes (4) are superimposed when sub-projections (10) with higher depth of field are generated than when projections (6) are generated.

(The simulated surgery that produces sub projection with a relatively high clarity of depth since few layers are superimposed; section 2.3).

As to claim 5, Delegacz et al teaches method in accordance with claim 4, characterised in that the plane (4) of the sub-projections (10) is parallel to the plane of the projection (6) (sequence of consecutive frames in parallel, paragraph 2; see also Cheng-Sheng figures on page 50).

As to claim 6, Delegacz et al teaches the method in accordance with claim 1, characterised in that a separate window is opened on the monitor, in which various sections are displayed by the object (7) within the frame of the selected sub-area (8) (figure 4).

As to claim 7, Delegacz et al teaches the method in accordance with claim 1, characterised in that a volume presentation or a surface display takes place in the separate window (paragraph 5.2 and figures 9 and 10).

As to claim 9, Delegacz et al teaches method in accordance with claim 1, characterised in that exactly one image plane (4) represents a sub-projection (10) (see figure 4).

As to claim 10, Delegacz et al teaches method in accordance with claim 1, characterised in that the user has interactive access to the image information in the sub-area (8) by moving a pointer instrument to scroll among different layers parallel to the projection planes (interactive software module, section 5.2, page 406, see also abstract).

As to claim 11, Delegacz et al teaches the method in accordance with claim 1, characterised in that the image data represents a part of a human or animal body and is recorded with a diagnostic system (lung image, section 5, pages 405-406).

As to claim 12, Delegacz et al teaches the method in accordance with claim 11, characterised in that the image data is recorded with a computer tomography (CT), a magnetic resonance tomography (MR), or by digital volume tomography (DVT) (In the particular area of lung imaging aimed to support screening and diagnosis of lung diseases the radiographic methods like conventional X-ray (XR) and computed tomography (CT) are most commonly used, page 402, Introduction)

As to claim 13, Cheng-Sheng teaches the method in accordance with claim 11, characterised in that the image data is recorded with a C-arch, which is rotated around the object (see Introduction).

11. Claims 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Delegacz et al (Three-dimensional visualization system as an aid for lung cancer detection) in view of Engel et al (Combing local and remote visualization techniques for interactive volume rendering in medical applications).

As to claim 14, Delegacz et al teaches the method in accordance with claim 1, characterised in that the detail image is generated with direct or indirect recourse to the image data, which is collected in a second data record, wherein this image data originates from another recording of the object (before submission to the 3D system the input data is usually preprocessed with segmentation algorithms to select the object of interest, the final result is either the 3D surface or volumetric representation of the acquired dataset, paragraph 2, page 402, and section 5.2). While Delegacz meets a number of the limitations of the claimed invention, as pointed out more fully above, Delegacz does not explicitly teaches the second data set.

Specifically, Engel et al. teaches the use of different data sets where a 3D representation of high quality the whole volume or a selected sub volume is rendered with 3D texture mapping on the remote graphics hardware (see figure 9). This strategy is also indispensable if the fusion of different data sets is performed to achieve better anatomical understanding (see figure 10). It would have been obvious to one of ordinary skill in the art to record different data sets with different device and in Delegacz in order to achieve better anatomical understanding. Therefore, the claimed invention would have been obvious to one of ordinary skill in the art at the time of the invention by applicant.

The limitations of claims 16-18 has been addressed above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NANCY BITAR whose telephone number is (571)270-1041.

The examiner can normally be reached on Mon-Fri (7:30a.m. to 5:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jing Wu can be reached on 571-272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jingge Wu/
Supervisory Patent Examiner, Art Unit 2624

Nancy Bitar

12-2-2008